CIRCULAR ECONOMY AND ENVIRONMENT

Iceland Liechtenstein Norway grants

SMILE

Sintra Motion & Innovation for Low Emissions


Circular Economy and Environment


Energy and Buildings


Sustainable Urban Mobility


Community, Art and Culture

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01. GLOSSARY

Circular economy - The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible, so that waste is reduced to a minimum.

Climate change - Climate Change refers to long-term shifts in temperatures and weather patterns. Since 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels.

Compost - Decaying organic matter that is added to soil to improve its quality, used for fertilizing and conditioning land.

Ecodesign - Ecodesign considers environmental aspects at all stages of the product development process, striving for products which make the lowest possible environmental impact throughout the product life cycle.

Sustainable development - Sustainable development is the kind of development that requires an integrated approach that takes into consideration environmental concerns along with economic development.

02. WHICH IS THE PURPOSE OF THIS GUIDE?

The world we live in is changing and it’s clear that we have to stop our unsustainable practices. Humanity has been consuming natural resources much faster than our planet’s capacity can generate.

It’s important to keep in mind that we’re all on this planet together, and it’s up to us to make sure that we leave it in a better place than we found it. We should internalize sustainability into our everyday life and companies’ values to build a better future.

The transition from a linear to a circular economy requires a joint effort by stakeholders from all sectors. Citizens should adopt more sustainable habits, increasing their environmental awareness and commitments. Companies can contribute to the transition by developing competencies in circular design to implement product reuse, recycling, and serving as trend-setters of innovative circular economy business models.

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"Waste is worse than loss. The time is coming when every person who lays claim to ability will keep the question of waste before him constantly. The scope of thrift is limitless."

Thomas A. Edison

The Circular Economy and Environment Guide is a comprehensive set of guidelines aimed at sharing information about which simple actions people can take to live in harmony with the environment.

This guide will help to:

Raise awareness about the notions of sustainability and circular economy, and acquire more information about the policies and projects that support the transition from a linear to a circular economy in the European Union;

Understand which are the issues concerning how to achieve a circular economy model;

Promote simple but cost-effective actions and good habits that individuals and companies can adopt to overcome these challenges.

03. HOW CAN WE DEFINE SUSTAINABILITY AND CIRCULAR ECONOMY?

What is sustainability?

The notion of sustainability shaped by the United Nations in the report “Our Common Future” means leaving a better world with sustainable ecological, economic and social conditions to future generations. According to the report, sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The Sustainable Development Goals (SDGs), defined in the UN 2030 Agenda, are the blueprint to achieve a better and more sustainable future for all. The 17 Goals are all interconnected, and in order to leave no one behind, it is important to learn more about each issue and take action.

Sustainable development requires an integrated approach that takes into consideration environmental and social concerns along with economic development.

The SDGs are based on three pillars:

Economic development: promote sustainable employment, build resilient infrastructures, reduce inequalities among countries, ensure sustainable consumption and production patterns;

Social inclusion: end poverty and hunger, ensure healthy lives and equitable quality education, achieve gender equality, ensure access to affordable energy, make cities resilient, promote peaceful societies;

Environmental protection: ensure sanitation for all, take urgent action to combat climate change and its impacts, conserve and sustainably use water resources, protect and restore territorial ecosystems and biodiversity.

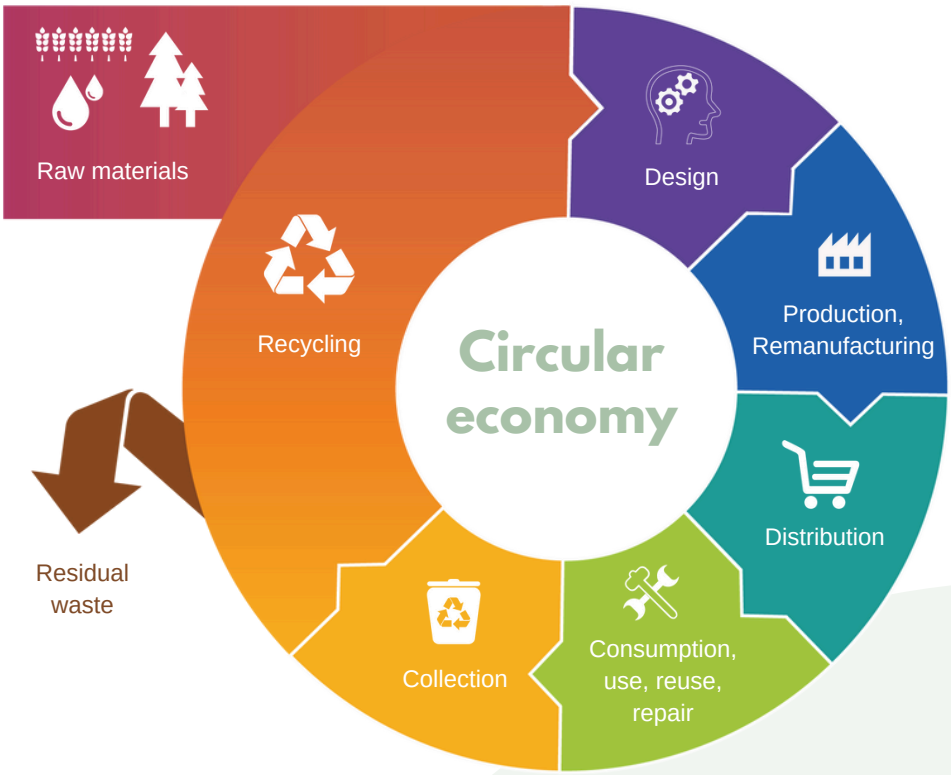
What is circular economy?

The circular economy concept is gaining attention as the consumption and use of resources increases to serve a fast-growing population with rising standards of living.

This new economic model represents a sustainable green growth, moving from a consumption and disposal-based linear model to a system that extends the life of products and materials and minimize waste.

In a fully circular economy, waste is minimized by designing products and industrial processes so that resources are kept in use in a perpetual flow, and by ensuring that unavoidable waste or residues are recycled or recovered.

The circular model has many environmental, climate, social and economic benefits. It goes beyond resource efficiency and recycling, providing the framework to develop new business models aimed at increasing the value, use and life of materials, products and assets and designing out waste from production and consumption.



The main advantages of the circular economy model are the following:

- Reduce raw material dependence
- Reducing impact on the environment
- Economic growth
- Greater collaboration between companies
- Improvement of products and savings on production on costs
- Business competitiveness increase
- Creating jobs
- Savings for families in the form of lower costs of primary resources and use of the products

The three fundamental drivers of the circular economy are:

Resource constraints: with global resource demand growing quickly, there is an increasing concern about looming shortages of critical raw materials and water;

Technological development: the introduction of new technologies is enabling the development and introduction of new circular economy business models, such as the tracking of products or materials during their life to enable extended use/life and maintain the highest possible value;

Social and economic development: increasing urbanization supports the development of circular models, since urban areas can easily host cost-effective collection and return systems for goods, materials and other resources, promoting the closing of circular loops.

04. WHICH IS THE MAIN CONTEXT?

What is the EU new circular economy action plan?

The new European Circular Economy Action Plan (2020) aims to turn the circular economy into a mainstream concept and disconnect economic growth from the use of resource. It includes initiatives that cover the whole life of products, targeting product design, promoting circular economy processes, fostering sustainable consumption, and ensuring that the resources we are using are kept in the economy as long as possible.

This plan aims to:

- make sustainable products the norm in the EU;
- empower consumers;
- focus on the sectors that use the most resources and where there is a high potential for circularity, such as packaging and plastics, electronics and Information and communication technologies, batteries, textiles, food waste, construction and buildings;
- ensure less waste;
- make circularity work for people, regions and cities;
- lead global efforts on circular economy.

What is the SMILE project?

SMILE is a project financed by EU grants that develops intelligent solutions that promote the transition to a low-carbon society. It includes activities concerning:

- **Circular Economy and Environment;**
- **Energy and Buildings;**
- **Sustainable Urban Mobility;**
- **Community, Art and Culture.**

The Circular Economy and Environment activities involves:

Community urban farming: in the Tabaqueira neighborhood, the residents will have a space for cultivation, using organic farming techniques and rainwater for irrigation; Also, an app will is available to exchange surplus agricultural products.

Composting - school contest: the school community of Alfredo da Silva Elementary and Secondary School will transform bio-waste into an organic corrective that can be used in agriculture and green spaces;

Repair Café and Ciclo Oficina: in the TabLab building, activities to reduce waste take place, providing the necessary tools to carry out repairs and adaptations for the reuse of materials, and supporting users of bicycles in the maintenance and use of this soft transport mode;

Intelligent automatic watering system: this system will ensure the irrigation of the garden considering local and weather conditions in Tabaqueira, avoiding wasted water;

Waste management system: this system encourages the disposal of recyclable waste at the respective collection points, through the use of the MySmile app.

05. WHAT CAN WE DO?

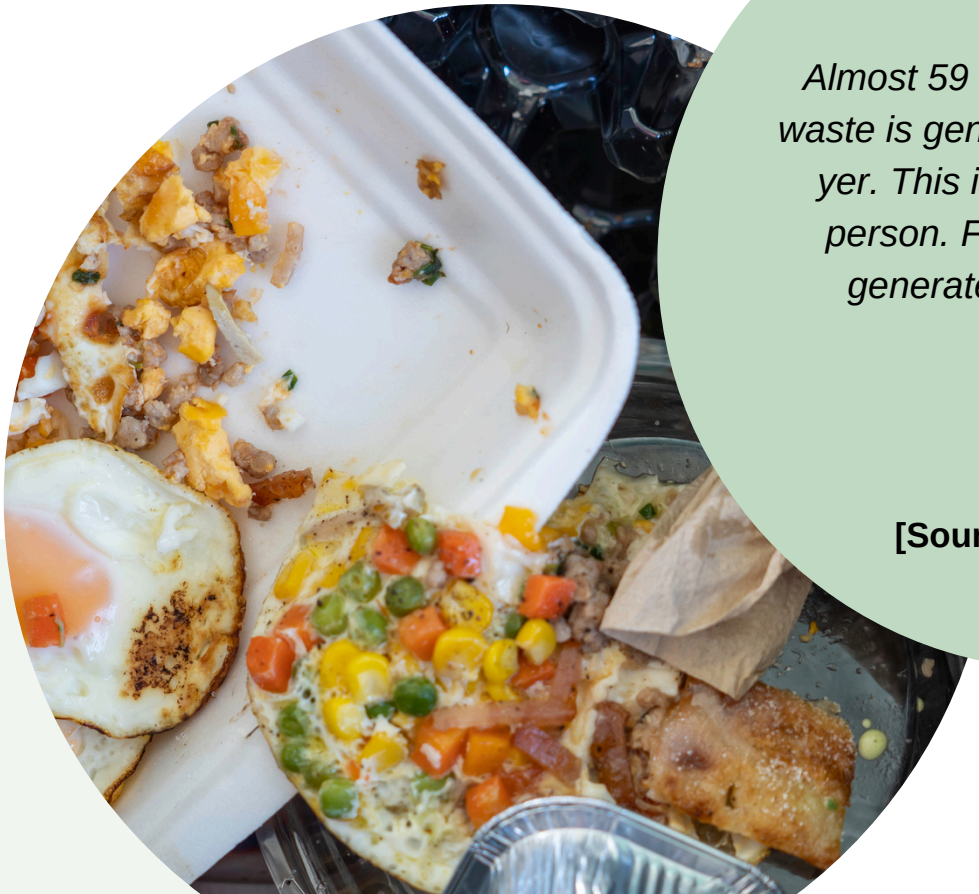
Organic material and bio-waste

	Issue	Guideline
Households	How to support local production?	Buying vegetables and fruits from local markets
	How to increase food recycling?	Consider home composting options for organic waste
	How to reduce food waste?	Separate bio-waste from other types of waste, using compostable bags or bins for collection
		Cook in bulk and freeze the excess
Companies	How to reduce food waste?	Establish a separate collection system within the workplace
		If you work in a restaurant or supermarket, donate the leftover food to needy people
	How to increase food recycling?	Explore options for composting or bio-waste treatment facilities that can turn into valuable resources

Why taking action?

Wasting puts pressure on the planet's limited natural resources, and it also has serious economic and social consequences. Organic material and the resulting waste are key material for achieving a circular economy.

An example of good practice: The "Community Fridges" are food distribution movements aimed at reducing food waste. Businesses and individuals donate their surplus food for the local community to collect and enjoy. Aside from stopping perfectly edible food from going to landfill, the fridges connect communities and increase access to nutritious, affordable food.



Almost 59 million tonnes of food waste is generated in the EU every yer. This is roughly 131 kg per person. Food waste is mainly generated by households.

[Source: Eurostat, 2021]

Water management

	Issue	Guideline
Households	How to reduce water waste?	Have a short shower
		Don’t keep the tap open while you are brushing your teeth
	How to reuse water efficiency?	Save the wasted water while you are waiting for warmer water in the shower and use it for watering plants
		Implement rainwater and/or grey water harvesting systems for garden irrigation or toilet fixtures
		Wash full loads of laundry and dishes
		Install water-efficient fixtures and appliances
Companies	How to reduce the environmental impacts related to water use?	Identify, measure, record, and report on significant environmental impacts related to water and implement measures to reduce use of water
	How to improve water efficiency?	Implement efficient water management systems, such as upgrading to water-saving fixtures and appliances

Why taking action?

Integrated and sustainable water management is critical to the achievement of the circular economy and to face resource shortages.

An example of good practice: The “SmartShower“ project, run by Flow Loop in Denmark, has designed the Eco Loop: an innovative shower panel that recycles water and energy using standard off-the-shelf components.

Eco Loop is based on a smart drain cover that enables the recycling process. It allows significant savings on water (up to 90%), energy (up to 80%) and CO_2 emissions (up to 80%).

On average, 144 litres of freshwater per person per day is supplied for household consumption in Europe. This is almost three times the water requirement established for basic human needs.

[Source: European Environmental Agency, 2015]

Textiles

	Issue	Guideline
Households	How to reduce the environmental impact of fast fashion?	Check out second-hand stores for clothes
		Check for the sustainable reports of brands and opt for clothing made from sustainable or recycled materials
	How to increase textiles recycling?	Recycle old textiles at dedicated facilities
	How to reduce textiles waste?	Donate unworn to charity organizations
		Learn basic repair skills to mend damaged clothing, instead of discarding them
Companies	How to reduce the environmental impact related to fast fashion?	Adopt sustainable production methods, such as eco-friendly materials and in-store recycling systems to transform old clothes in new ones
	How to promote awareness to reduce the environmental impact related to fast fashion?	Encourage consumer behavior change by promoting the longevity and durability of their products, offering repair services and facilitating recycling programs

Why taking action?

Despite the fact that around 95% of end-of-use textiles can be recycled, most still end up in landfill incineration. It is necessary to boost the EU market for sustainable and circular textiles, addressing fast fashion and driving new business models.

An example of good practice: The “Clothes Swapping“ organized by the Erasmus Student Network (ESN) had the purpose to favor items recycling. Erasmus students could come to ESN offices to leave clothes in good estate and got a corresponding number of tickets.

After, there has been a “market“, in which students could “buy“ other clothes using their tickets. At the end of the event, the remaining clothes have been donated to HUMANA association.

EU consumption of textiles has, on average,the fourth highest impact on the environment and climate change. 12 kg of textile waste are generate per person every year. 22% of textile waste is collected separately for reuse or recycling.

[Source: European Commission]

Packaging and plastics

	Issue	Guideline
Households	How to reduce plastic waste?	Buy products that can be re-used (e.g. bamboo toothbrush, reusable shopping bag)
	How to increase plastics recycling rates?	Recycle plastics correctly according to local guidelines
	How to reduce packaging waste?	Support brands that prioritize sustainable packaging
	How to promote environmental awareness and commitment?	Participate in environmental clean-up activities
Companies	How to reduce the environmental impacts related to plastic waste?	Identify, measure, record, and report on significant impacts within the life cycle of products, and implement the life-cycle assessment for eco-conception
	How to promote environmental awareness and commitment?	Offer consumers environmentally beneficial products and services considering the full life cycle, and provide consumers' information about the impact of their choices of products and services on the environment

Why taking action?

Packaging waste is growing in the EU and low recycling rates impact the economy, the environment and public health. Despite measures and efforts to reduce packaging, the amount of packaging waste in the EU is growing.

An example of good practice: Periodically, the collective of Bologna University students “Non è solo maltempo“ organizes clean-up activities to collect waste in Rimini, with the support of WWF Italy.

The first clean-up has been organized to clean the beach after the flood that affected the Emilia-Romagna region in May 2023, when many students and families helped out, strengthening the sense of community.

The global production and incineration of plastic leads to 400 million tonnes of CO_2 emissions per year.

Only the 12.4% of plastic is recycled in Europe.

[Source: Our World in Data, 2019]

Electronics and ICT

	Issue	Guideline
Households	How to increase electronics recycling rates?	Recycle old electronics at designated facilities or through retailer recycling programs
	How to reduce e-waste?	Check out second-hand stores for furniture
		Before purchasing new devices, consider repairing existing ones
		Donate still-functional devices to those in need
Companies	How to reduce the environmental impacts related to e-waste?	Adopt sustainable design practices, making products easier to repair and using durable materials
	How to reduce e-waste?	Offer extended warranties and repair services

Why taking action?

Waste of electrical and electronic equipment includes consumer electronics and IT equipment, household appliances, sports equipment with electronic components and electronic tools. Value is lost when fully or partially functional products are discarded because they are not reparable, the battery cannot be replaced, or the software is no longer supported. Most electric appliances are made up of a mix of materials and components that can be hazardous to our health and the environment, when not properly managed.

An example of good practice: “Sustronics“ is a project targeting to improve the capabilities of the European electronics industry towards a circular economy, eco-design, bio-based materials and energy-efficient manufacturing processes.

EU consumers generate 11,000 tonnes of electronic waste every year in the form of discarded and unused charges. Europe is the continent that generates the most e-waste per capita.

[Source: European Parliament]

06. SMILE AND CIRCULAR ECONOMY

Circular economy and climate change

The current linear resource-wasting model is depleting the Earth's natural capital. The associated pressure on the Earth's ecosystems and their absorption capacity will bring irreversible changes to our environment and climate.

Circular economy activities can be an effective way to mitigate climate change, by improving resource efficiency, extending the useful life of buildings and assets, increased recycling and reuse, and an absolute reduction in the use of primary raw materials, and so, reducing greenhouse gas emissions related to the extraction, transport and processing of raw materials.

Circular economy and energy

The circular economy has a significant connection to energy by promoting energy efficiency and renewable energy use.

Additionally, it encourages the development of new technologies and energy systems that are more efficient and less reliant on fossil fuels. By reducing waste and optimizing resource use, the circular economy contributes to lowering energy demand and fostering the transition towards a more sustainable energy system.

Circular economy and Sustainable mobility

The circular economy and sustainable mobility are deeply interconnected. By designing vehicles and infrastructure that are durable, recyclable, and energy-efficient, the circular economy aims to decrease the environmental footprint of transportation.

This approach not only conserves resources but also lowers emissions, supporting the transition towards a more sustainable and low-carbon mobility system.

Circular economy, art and culture

The connection between the circular economy and art and culture lies in promoting sustainability through creative practices. Artists and cultural organizations can use recycled materials and sustainable methods to produce art.

This approach not only reduces waste and conserves resources but also raises public awareness about environmental issues in local communities and the importance of recycling and sustainability.

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